```
   1 agatttgaat cgcgggaccc gttggcagag gtggcggcgg cggcatgggt gccccgacgt
  61 tgccccctgc ctggcagccc tttctcaagg accaccgcat ctctacattc aagaactggc
 121 ccttcttgga gggctgcgcc tgcaccccgg agcggatggc cgaggctggc ttcatccact
 181 gccccactga gaacgagcca gacttggccc agtgtttctt ctgcttcaag gagctggaag
 241 gctgggagcc agatgacgac cccatagagg aacataaaaa gcattcgtcc ggttgcgctt
 301 tcctttctgt caagaagcag tttgaagaat taacccttgg tgaatttttg aaactggaca
 361 gagaaagagc caagaacaaa attgcaaagg aaaccaacaa taagaagaaa gaatttgagg
 421 aaactgcgaa gaaagtgcgc cgtgccatcg agcagctggc tgccatggat tgaggcctct
 481 ggccggagct gcctggtccc agagtggctg caccacttcc agggtttatt ccctggtgcc
 541 accagccttc ctgtgggccc cttagcaatg tcttaggaaa ggagatcaac attttcaaat
 601 tagatgtttc aactgtgctc ttgttttgtc ttgaaagtgg caccagaggt gcttctgcct
 661 gtgcagcggg tgctgctggt aacagtggct gcttctctct ctctctctct tttttggggg
 721 ctcatttttg ctgttttgat tcccgggctt accaggtgag aagtgaggga ggaagaaggc
 781 agtgtccctt ttgctagagc tgacagcttt gttcgcgtgg gcagagcctt ccacagtgaa
 841 tgtgtctgga cctcatgttg ttgaggctgt cacagtcctg agtgtggact tggcaggtgc
 901 ctgttgaatc tgagctgcag gttccttatc tgtcacacct gtgcctcctc agaggacagt
 961 ttttttgttg tgtttttttt ttttttttgt ggtagatgca tgacttgtgt gtgatgagag
1021 aatggagaca gagtccccgg ctcctctact gtttaacaac atggctttct tattttgttt
1081 gaattgttaa ttcacagaat agcacaaact acaattaaaa ctaagcacaa agccattcta
1141 agtcattggg gaaacggggt gaacttcagg tggatgagga gacagaatag agtgatagga
1201 agcgtctggc agatactcct tttgccactg ctgtgtgatt agacaggccc agtgagccgc
1261 ggggcacatg ctggccgctc ctccctcaga aaaaggcagt ggcctaaatc ctttttaaat
1321 gacttggctc gatgctgtgg gggactggct gggctgctgc aggccgtgtg tctgtcagcc
1381 caaccttcac atctgtcacg ttctccacac gggggagaga cgcagtccgc ccaggtcccc
1441 gctttctttg gaggcagcag ctcccgcagg gctgaagtct ggcgtaagat gatggatttg
1501 attcgccctc ctccctgtca tagagctgca gggtggattg ttacagcttc gctggaaacc
1561 tctggaggtc atctcggctg ttcctgagaa ataaaaagcc tgtcatttca aataaaaaaa
1621 aaaaaaaaaa aaaaaaaaaa aaa   (SEQ ID NO: 1)HUMAN SURVIVIN
```

FIG. 1

MGAPTLPPAWQPFLKDHRISTFKNWPFLEGCACTPERMAEAGFIHCPTENE
PDLAQCFFCFKELEGWEPDDDPIEEHKKHSSGCAFLSVKKQFEELTLGEFL
KLDRERAKNKIAKETNNKKKEFEETAKKVRRAIEQLAAMD (SEQ ID NO: 2)

HUMAN SURVIVIN

FIG. 2

```
   1 ggcacgaggg ggccggggct ctcccggcat gctctgcggc gcgcctccgc ccgcgcgatt
  61 tgaatcctgc gtttgagtcg tcttggcgga ggttgtggtg acgccatcat gggagctccg
 121 gcgctgcccc agatctggca gctgtacctc aagaactacc gcatcgccac cttcaagaac
 181 tggcccttcc tggaggactg cgcctgcacc ccagagcgaa tggcggaggc tggcttcatc
 241 cactgcccta ccgagaacga gcctgatttg gcccagtgtt ttttctgctt taaggaattg
 301 gaaggctggg aacccgatga caacccgata gaggagcata gaaagcactc ccctggctgc
 361 gccttcctca ctgtcaagaa gcagatggaa gaactaaccg tcagtgaatt cttgaaactg
 421 gacagacaga gagccaagaa caaaattgca aaggagacca acaacaagca aaaagagttt
 481 gaagagactg caaagactac ccgtcagtca attgagcagc tggctgccta atgctgagcc
 541 tttgctgaga taacttggac ctgagtgaca tgccacatct aagccacgca tcccagcttt
 601 tccagccagg gcctcctagc aggatcttag agaaggagac agtggtattt tgaaactgga
 661 tatcaaatat ttttggtttt gctttaaagt ggctacctct ctttggtttt gtggctttgc
 721 tctattgtga cgtggactta agcaataagg aagtgatgaa gggacagtgt tctctgacag
 781 gacctgtggg ggtcggggtg cctgtgcaag gtcttggttc tgattgtgat atttccatac
 841 agggctgcta atgcagccca tgggtaagtg tggttatatg tgtttgtgct gataattttg
 901 tcctgatgag ttttcctacc acggggtaac ggaataaaat cacttgaaaa agtgg
```

(SEQ ID NO: 3)

(MURINE TIAP)

FIG. 3

MGAPALPQIWQLYLKNYRIATFKNWPFLEDCACTPERMAEAGFIHCPTENE
PDLAQCFFCFKELEGWEPDDNPIEEHRKHSPGCAFLTVKKQMEELTVSEFL
KLDRQRAKNKIAKETNNKQKEFEETAKTTRQSIEQLAA (SEQ ID NO: 4)

(MURINE TIAP)

FIG. 4

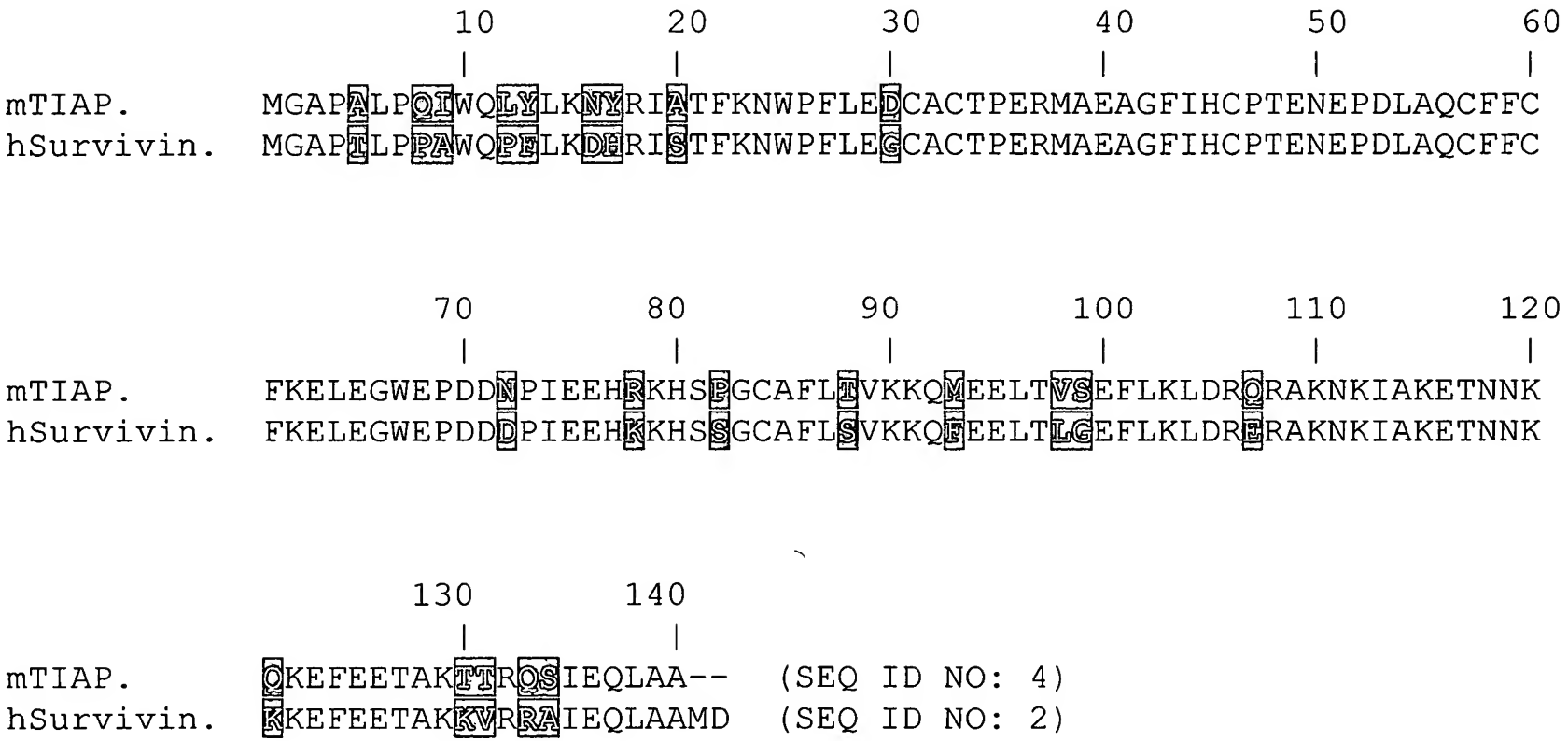

10 20 30 40 50 60
mTIAP. MGAPALPQIWQLYLKNYRIATFKNWPFLEDCACTPERMAEAGFIHCPTENEPDLAQCFFC
hSurvivin. MGAPTLPPAWQPFLKDHRISTFKNWPFLEGCACTPERMAEAGFIHCPTENEPDLAQCFFC
70 80 90 100 110 120
mTIAP. FKELEGWEPDDNPIEEHRKHSPGCAFLTVKKQMEELTVSEFLKLDRQRAKNKIAKETNNK
hSurvivin. FKELEGWEPDDDPIEEHKKHSSGCAFLSVKKQFEELTLGEFLKLDRERAKNKIAKETNNK
130 140
mTIAP. QKEFEETAKTTRQSIEQLAA-- (SEQ ID NO: 4)
hSurvivin. KKEFEETAKKVRRAIEQLAAMD (SEQ ID NO: 2)

FIG. 5

```
   1 cttgcagctg cccacctcac cctcagctct ggcctcttac tcaccctcta ccacagacat
  61 ggctcagtca ctggctctga gcctccttat cctggttctg gcctttggca tccccaggac
 121 ccaaggcagt gatggagggg ctcaggactg ttgcctcaag tacagccaaa ggaagattcc
 181 cgccaaggtt gtccgcagct accggaagca ggaaccaagc ttaggctgct ccatcccagc
 241 tatcctgttc ttgccccgca agcgctctca ggcagagcta tgtgcagacc caaaggagct
 301 ctgggtgcag cagctgatgc agcatctgga caagacacca tccccacaga aaccagccca
 361 gggctgcagg aaggacaggg gggcctccaa gactggcaag aaaggaaagg gctccaaagg
 421 ctgcaagagg actgagcggt cacagacccc taaagggcca tagcccagtg agcagcctgg
 481 agccctggag accccaccag cctcaccaac gcttgaagcc tgaacccaag atgcaagaag
 541 gaggctatgc tcaggggccc tggagcagcc accccatgct ggccttgcca cactctttct
 601 cctgctttaa ccaccccatc tgcattccca gctctaccct gcatggctga gctgcccaca
 661 gcaggccagg tccagagaga ccgaggaggg agagtctccc agggagcatg agaggaggca
 721 gcaggactgt ccccttgaag gagaatcatc aggaccctgg acctgatacg gctccccagt
 781 acaccccacc tcttccttgt aaatatgatt tatacctaac tgaataaaaa gctgttctgt
 841 cttcccaccc gc    (SEQ ID NO: 5)
```

(HUMAN SLC)

FIG. 6

MAQSLALSLLILVLAFGIPRTQGSDGGAQDCCLKYSQRKIPAKVVRSYRKQ
EPSLGCSIPAILFLPRKRSQAELCADPKELWVQQLMQHLDKTPSPQKPAQG
CRKDRGASKTGKKGKGSKGCKRTERSQTPKGP (SEQ ID NO: 6)

(HUMAN SLC)

FIG. 7

```
   1 gaattcggcc aaagaggcct acggccaaag agggctaaac ttgcggctgt ccatctcacc
  61 tacagctctg gtctcatcct caactcaacc acaatcatgg ctcagatgat gactctgagc
 121 ctccttagcc tggtcctggc tctctgcatc ccctggaccc aaggcagtga tggaggggt
 181 caggactgct gccttaagta cagccagaag aaaattccct acagtattgt ccgaggctat
 241 aggaagcaag aaccaagttt aggctgtccc atcccggcaa tcctgttctc accccggaag
 301 cactctaagc ctgagctatg tgcaaaccct gaggaaggct gggtgcagaa cctgatgcgc
 361 cgcctggacc agcctccagc cccagggaaa caaagccccg gctgcaggaa gaaccgggga
 421 acctctaagt ctggaaagaa aggaaagggc tccaagggct gcaagagaac tgaacagaca
 481 cagccctcaa gaggatagcc cagtagcccg cctggagccc aggagatccc ccacgaactt
 541 caagctgggt ggttcacggt ccaactcaca ggcaaagagg gagctagaaa acagactcag
 601 gagccgctag tcgag  (MURINE SLC CCL21b)
```

(SEQ ID NO: 7)

FIG. 8

MAQMMTLSLLSLVLALCIPWTQGSDGGGQDCCLKYSQKKIPYSIVRGYRKQ
EPSLGCPIPAILFSPRKHSKPELCANPEEGWVQNLMRRLDQPPAPGKQSPG
CRKNRGTSKSGKKGKGSKGCKRTEQTQPSRG (SEQ ID NO: 8)

(MURINE SLC CCL21b)

FIG. 9

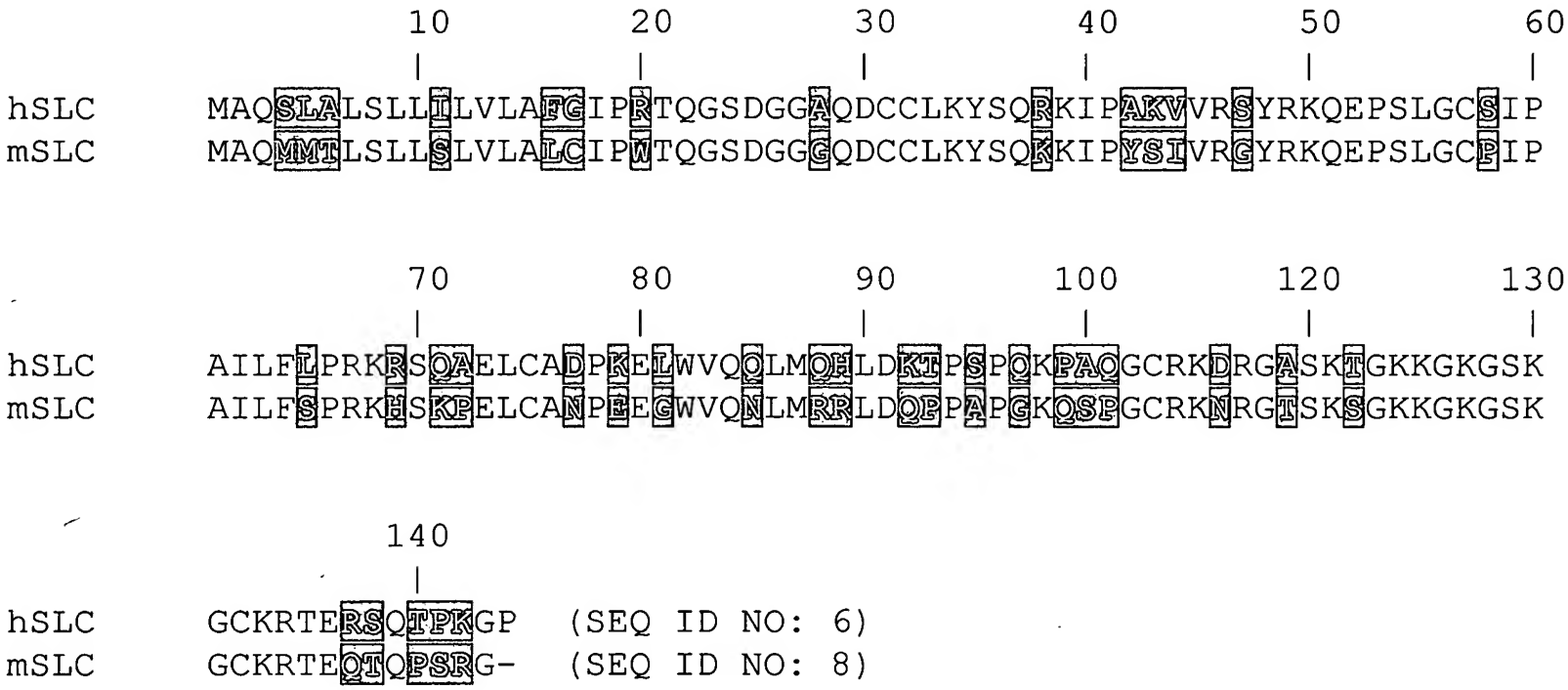

10 20 30 40 50 60
hSLC MAQSLALSLLLILVLAFGIPRTQGSDGGAQDCCLKYSQRKIPAKVVRSYRKQEPSLGCSIP
mSLC MAQMMTLSLLLSLVLALCIPWTQGSDGGGQDCCLKYSQKKIPYSIVRGYRKQEPSLGCPIP
70 80 90 100 120 130
hSLC AILFLPRKRSQAELCADPKELWVQQLMQHLDKTPSPQKPAQGCRKDRGASKTGKKGKGSK
mSLC AILFSPRKHSKPELCANPEEGWVQNLMRRLDQPPAPGKQSPGCRKNRGTSKSGKKGKGSK
140
hSLC GCKRTERSQTPKGP (SEQ ID NO: 6)
mSLC GCKRTEQTQPSRG- (SEQ ID NO: 8)

FIG. 10

Murine minor histocompatibility antigen H60 (partial)

```
   1 tgagggaaga ccatggcaaa gggagccacc agcaagagca accattgcct gattctgagc
  61 cttttcattc tgctgagcta tctggggacc atactggcag atggtacaga ctctctaagt
 121 tgtgaattaa ctttcaacta tcgtaatcta catggacagt gctcagtgaa tggaaagact
 181 ctccttgatt ttggtgataa aaaacatgag gaaaatgcta ctaagatgtg tgctgatttg
 241 tcccaaaacc tgagagagat ttcagaagag atgtggaagt tacaatcagg taatgatacc
 301 ttgaatgtca caacacaatc tcagtataat caaggaaaat tcattgatgg attctgggcc
 361 atcaacactg atgaacagca tagcatctac ttttatccac ttaatatgac ctggagagaa
 421 agtcattctg ataacagcag tgccatggag cagtggaaga acaagaacct agagaaagat
 481 atgaggaatt tcctcatcac atatttcagt cactgcctca acaaatcgtc atcacacttt
 541 agagaaatgc caaaatcaac attaaaggtg ccggatacca cccaacgtac aaatgccact
 601 cagattcatc ctacagtgaa taacttccga cataattctg acaaccaggg tctgagtgtc
 661 acctggattg tgattatatg tataggagga ttagtgtctt tcatggcatt catggtattc
 721 gcttggtgta tgctgaagaa aaaaaa  (SEQ ID NO: 9)
```

FIG. 11

MINOR histocompatibility antigen H60 (partial)

MAKGATSKSNHCLILSLFILLSYLGTILADGTDSLSCELTFNYR
NLHGQCSVNGKTLLDFGDKKHEENATKMCADLSQNLREISEEMWKLQSGNDTLNVTTQ
SQYNQGKFIDGFWAINTDEQHSIYFYPLNMTWRESHSDNSSAMEQWKNKNLEKDMRNF
LITYFSHCLNKSSSHFREMPKSTLKVPDTTQRTNATQIHPTVNNFRHNSDNQGLSVTW
IVIICIGGLVSFMAFMVFAWCMLKKK (SEQ ID NO: 10)

FIG. 12

Expression constructs for SLC and TIAP in a pBudCE4.1vector

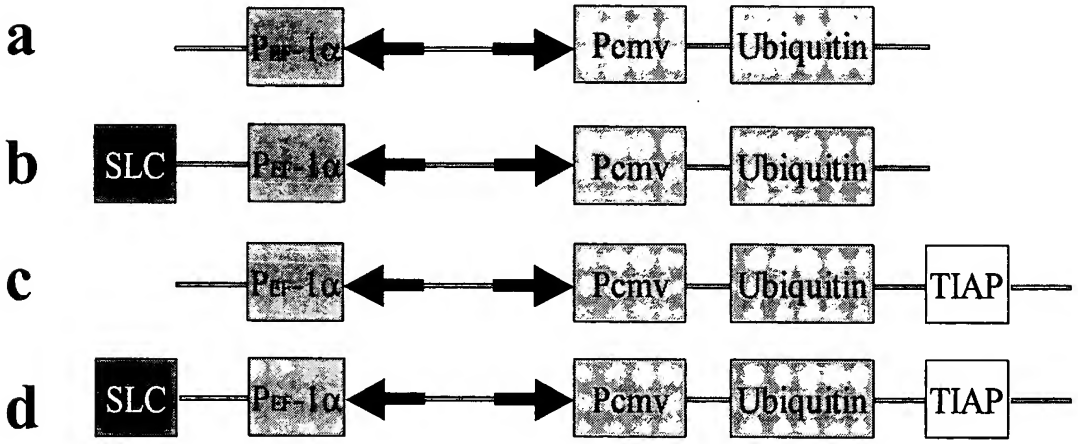


FIG. 13

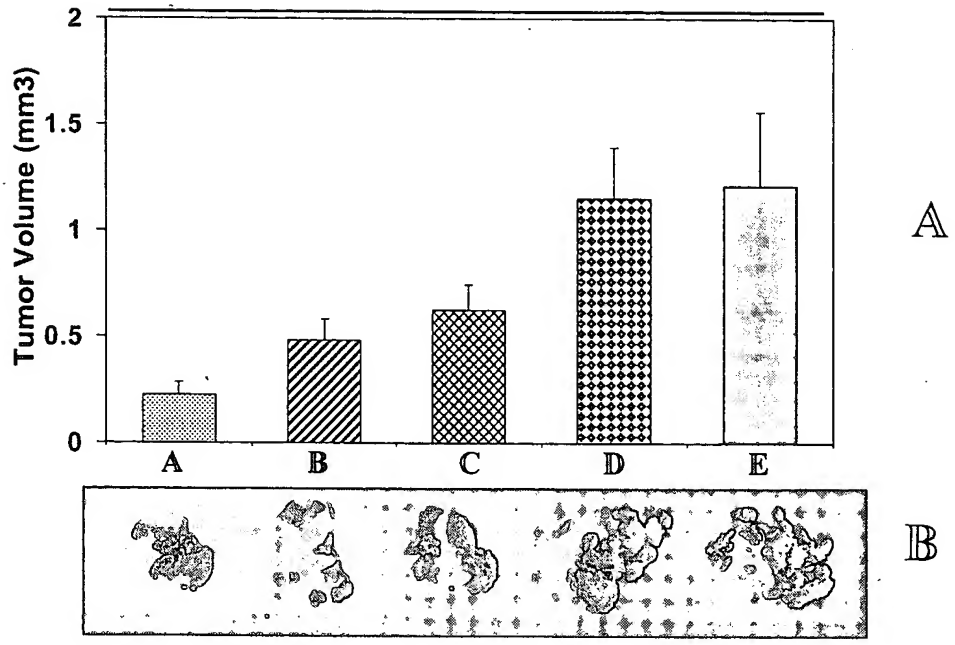


FIG. 14

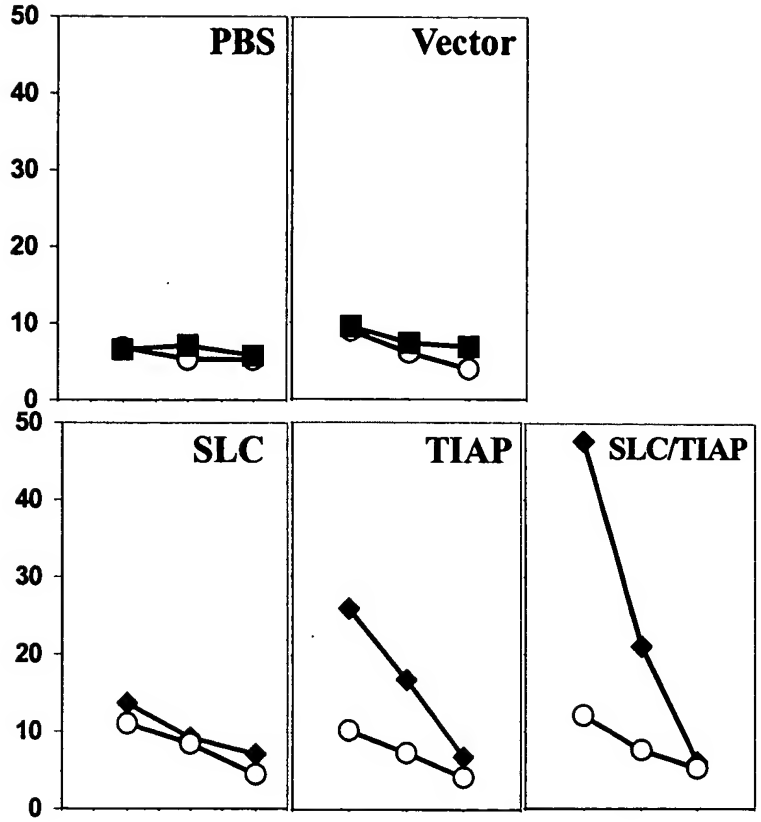


FIG. 15

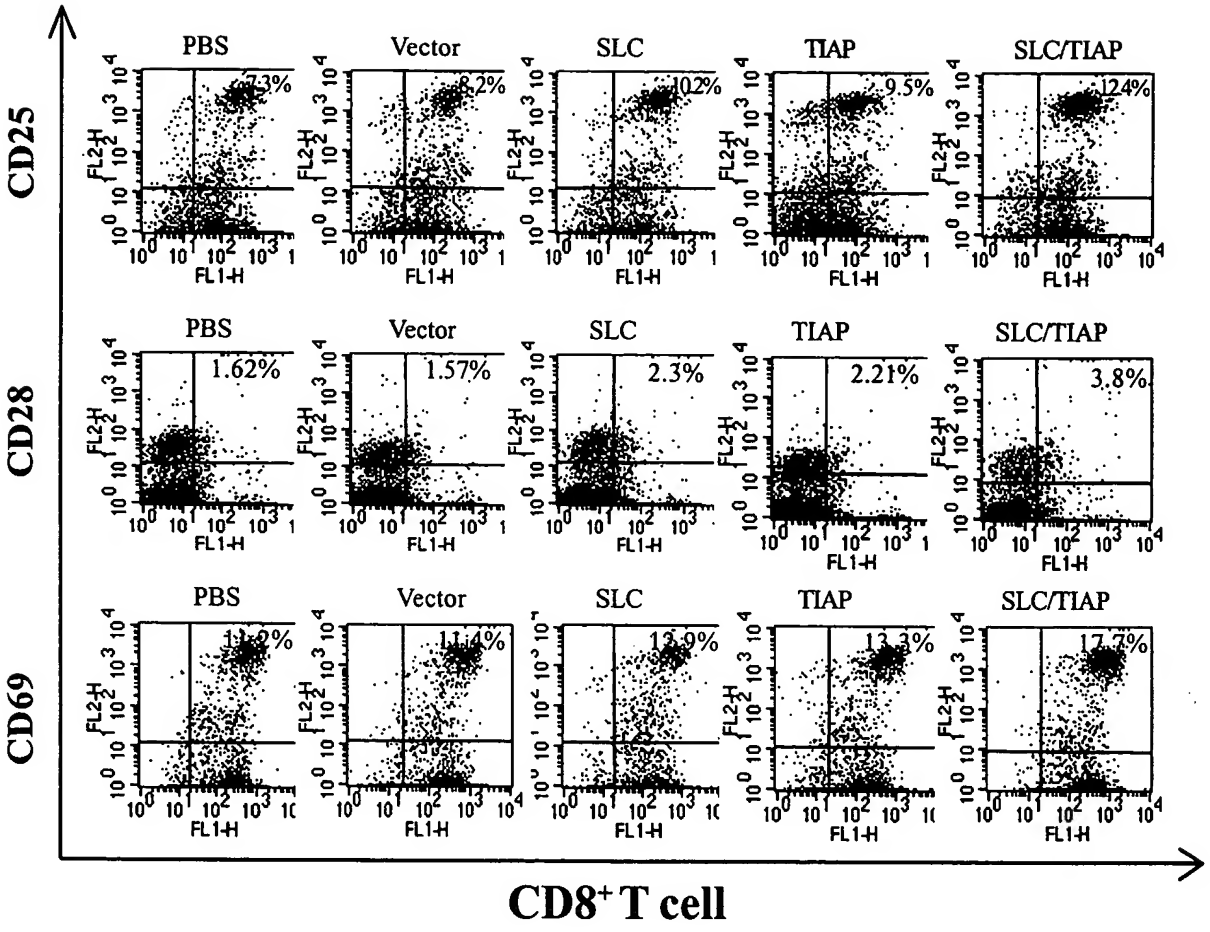

PBS
Vector
SLC
TIAP
SLC/TIAP
CD25
CD28
CD69
7.3%
8.2%
10.2%
9.5%
12.4%
1.62%
1.57%
2.3%
2.21%
3.8%
11.4%
13.3%
17.7%
FL1-H
FL2-H
CD8+ T cell

FIG. 16

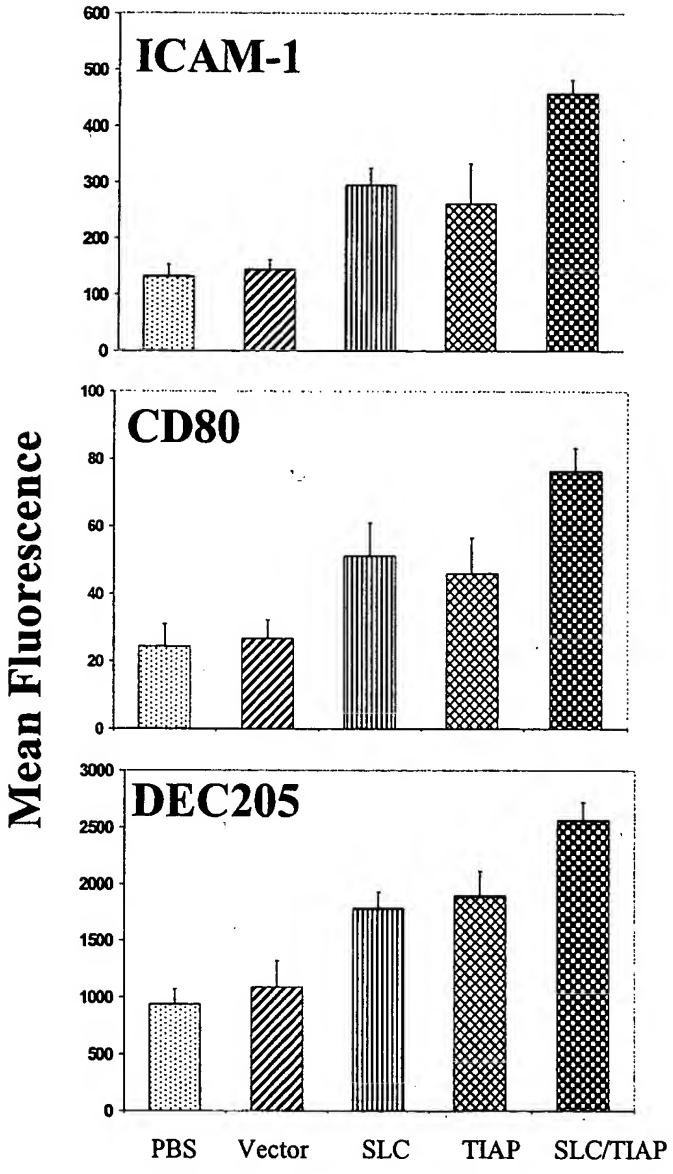

ICAM-1
CD80
DEC205
Mean Fluorescence
600
500
400
300
200
100
0
100
80
60
40
20
0
3000
2500
2000
1500
1000
500
0
PBS
Vector
SLC
TIAP
SLC/TIAP

FIG. 17

Production of intracellular IFN-γ by DNA vaccine

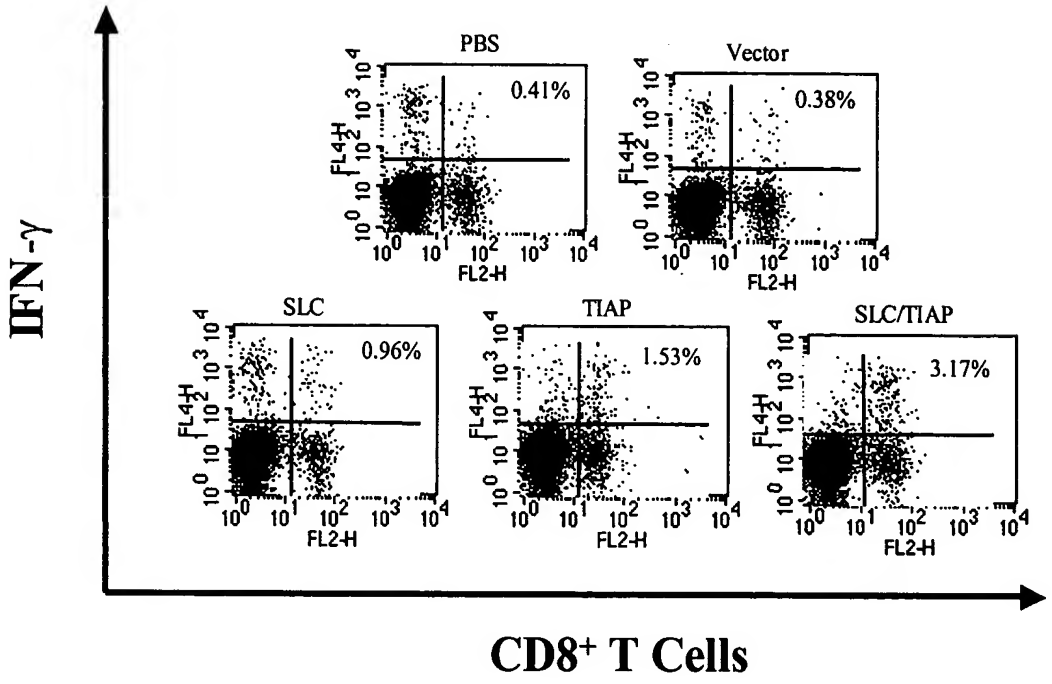
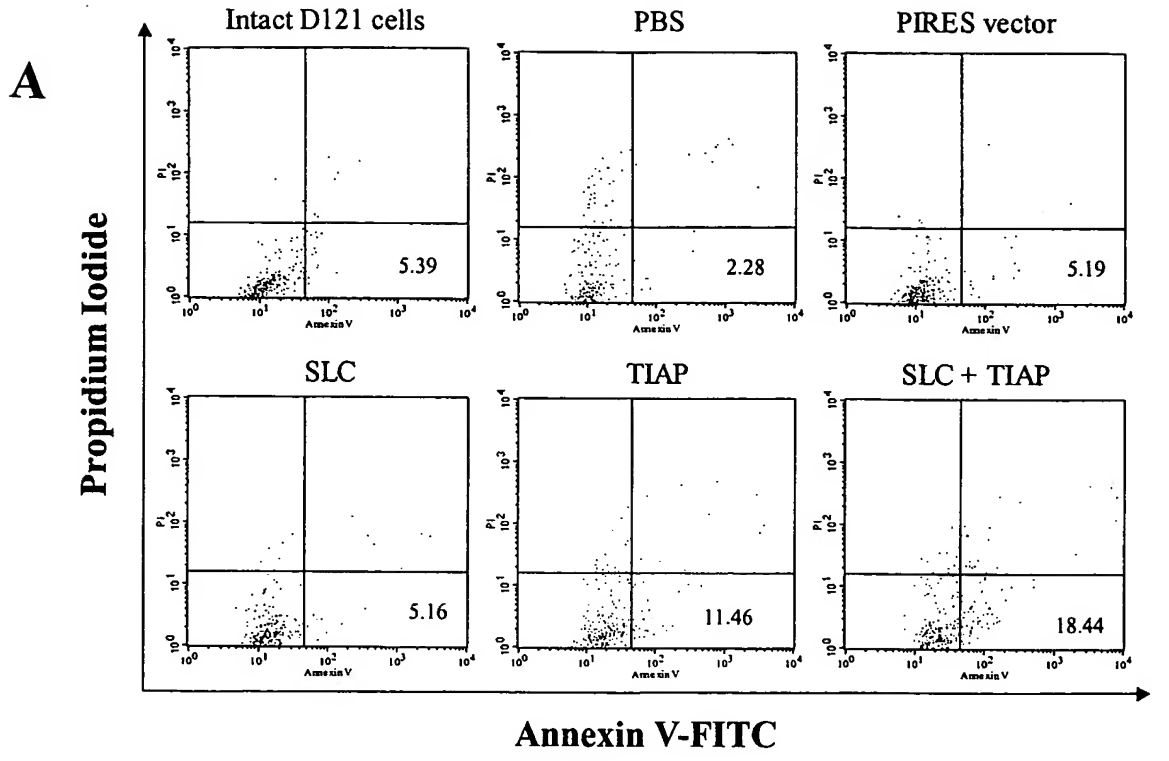


FIG. 18


A
Intact D121 cells
PBS
PIRES vector
SLC
TIAP
SLC + TIAP
5.39
2.28
5.19
5.16
11.46
18.44
Propidium Iodide
Annexin V-FITC

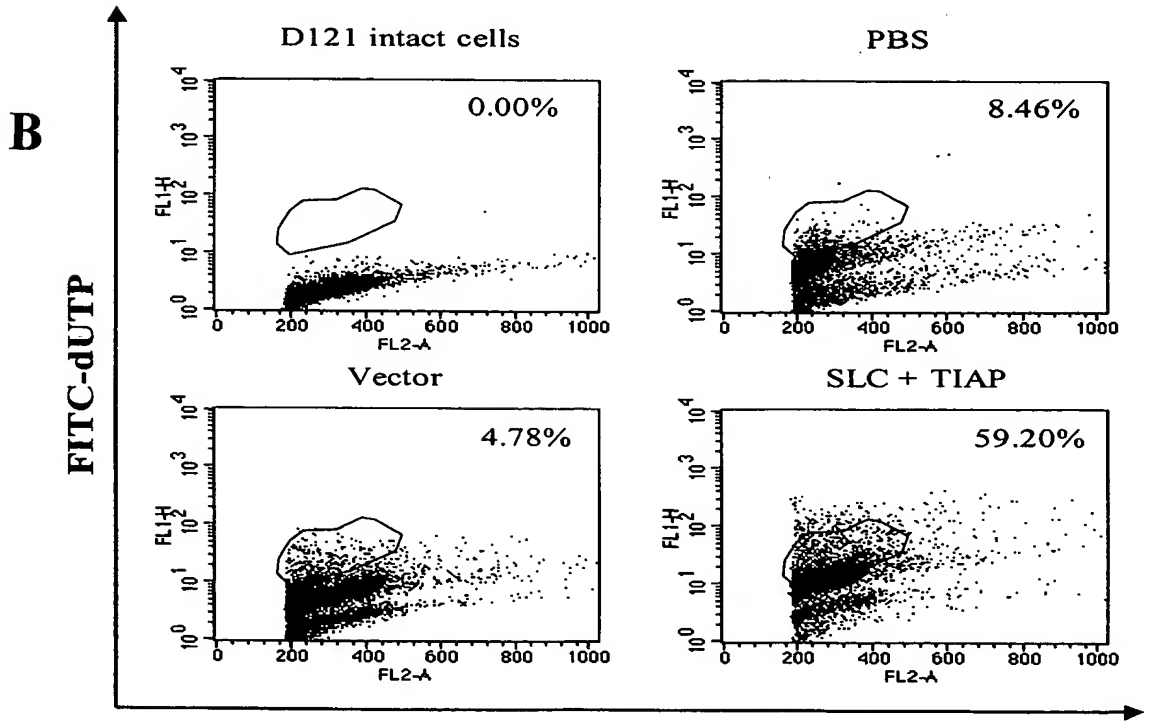

B
D121 intact cells
PBS
Vector
SLC + TIAP
0.00%
8.46%
4.78%
59.20%
FITC-dUTP
FL1-H
FL2-A

FIG. 19

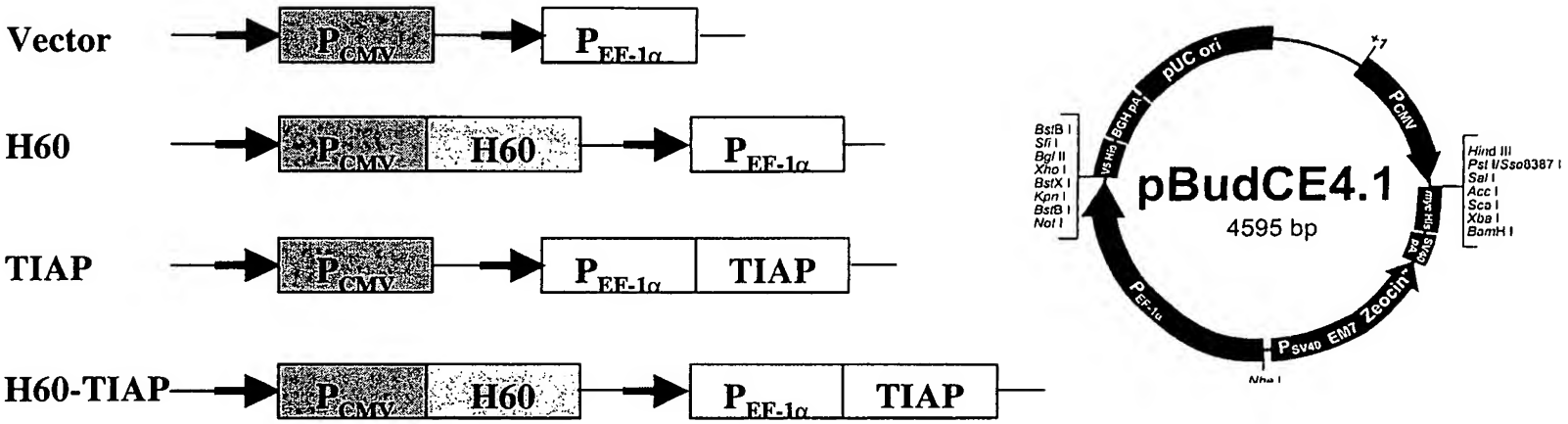
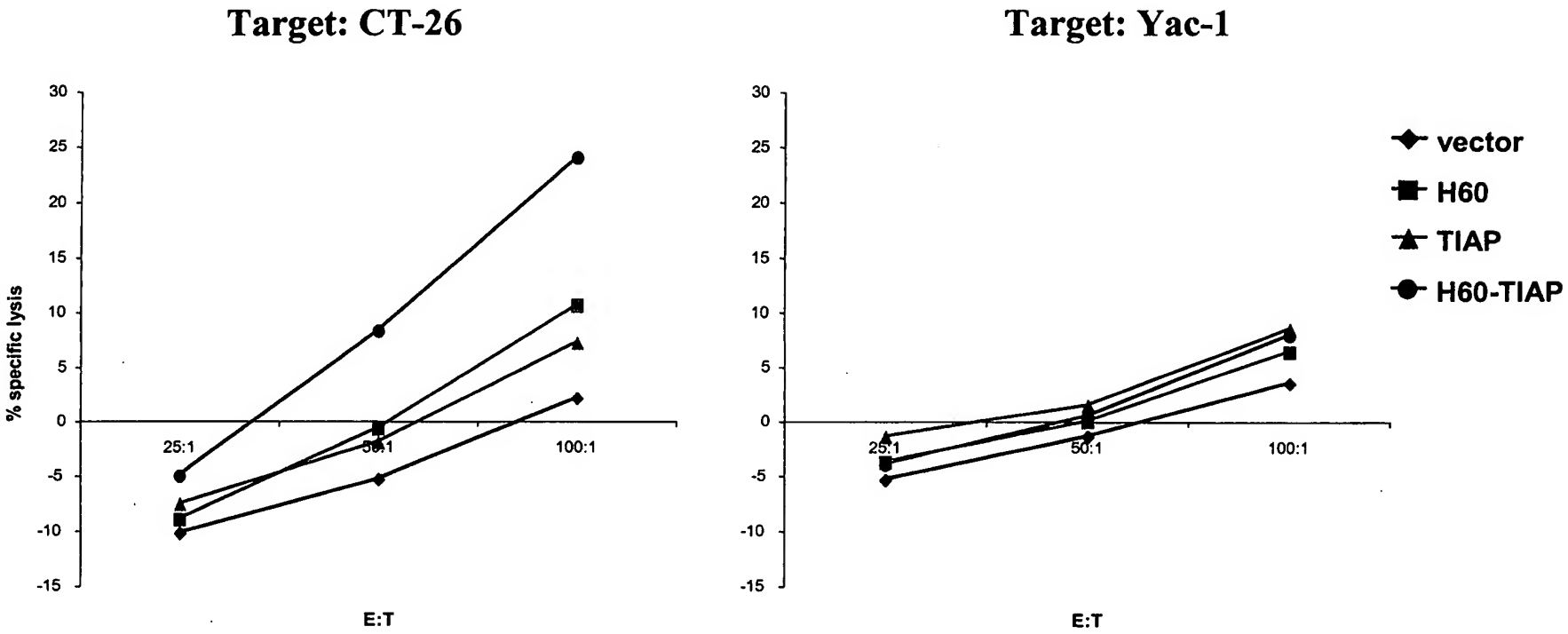

Vector
H60
TIAP
H60-TIAP
H60
TIAP
pBudCE4.1
4595 bp
pUC ori
PCMV
Zeocin
BstB I
Sfi I
Bgl II
Xho I
BstX I
Kpn I
BstB I
Not I
Hind III
Pst I/Sso8387 I
Sal I
Acc I
Sca I
Xba I
BamH I

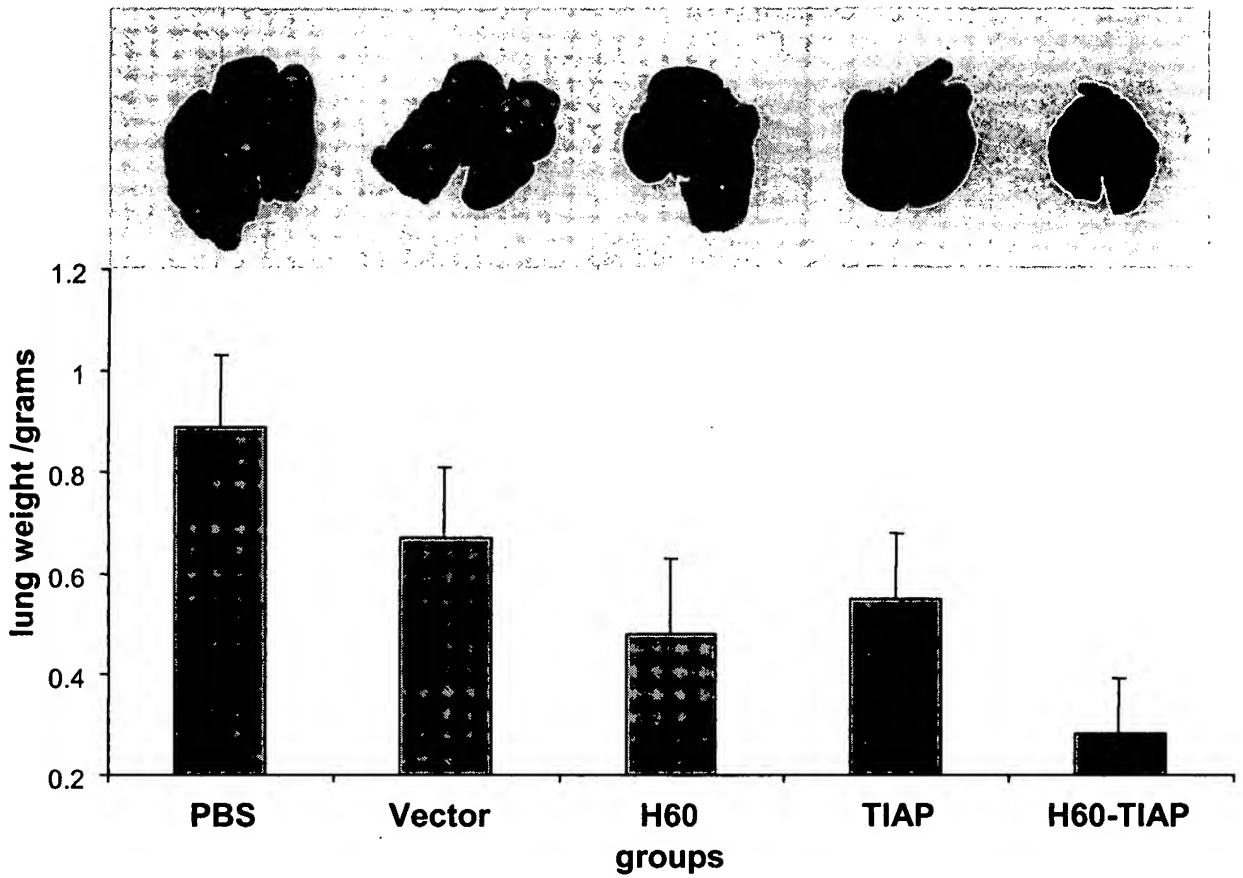
FIG. 20



BALB/c mice were immunized 3 times at 2 week intervals with attenuated *Salmonella typhimurium* harboring the vectors as indicated. Two weeks after the last immunization, mice were sacrificed, splenocytes were isolated and stimulated with irradiated CT-26 cells. Cells were harvested 5 days later and cytotoxic assays performed with either CT-26 or Yac-1 cells as targets.

FIG. 21

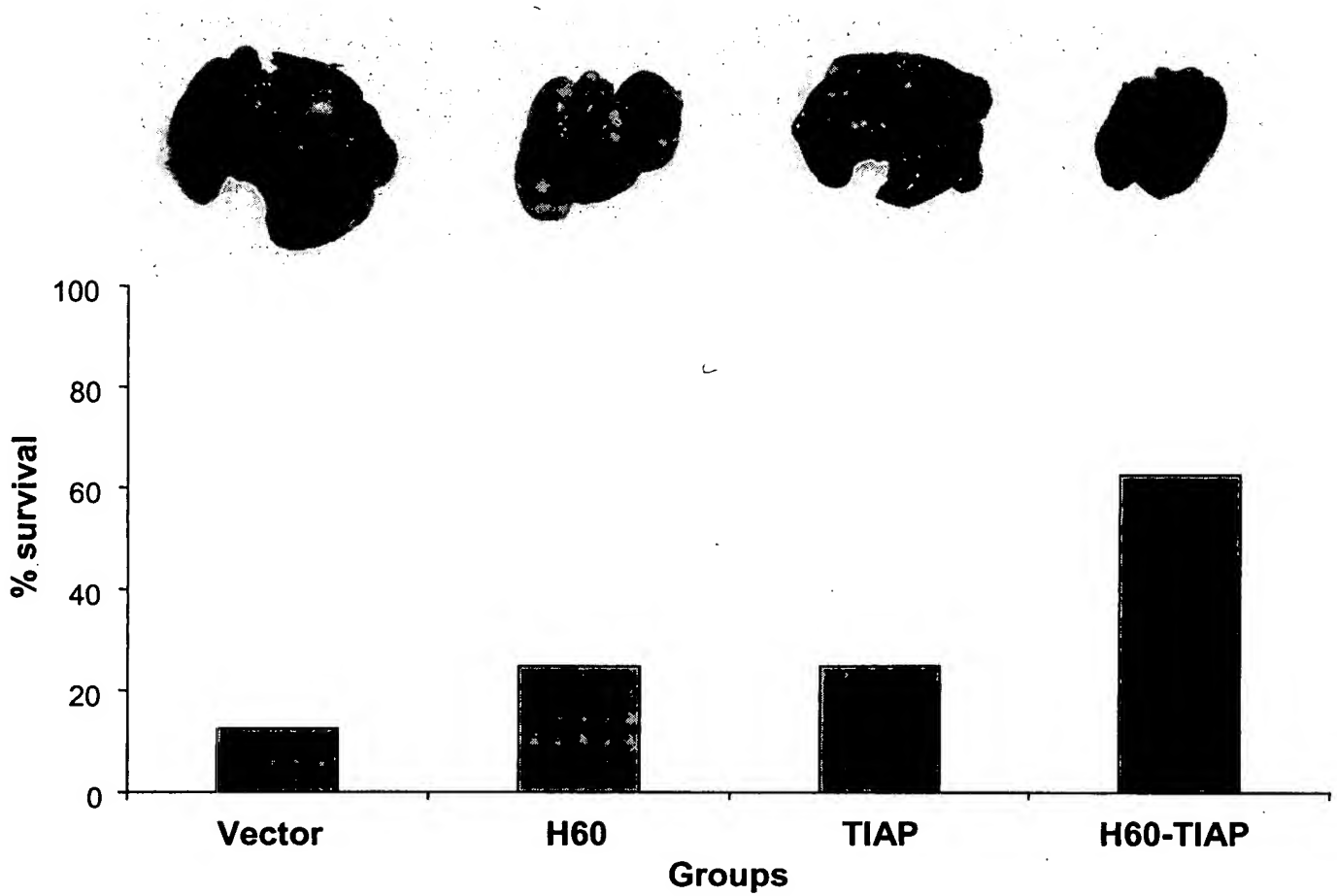
Prophylactic models



BALB/c mice were immunized 3 times at 2 week intervals with attenuated *Salmonella typhimurium* harboring the vectors as indicated. Two weeks after the last immunization, mice were challenged i.v. with $1x10_{\square}^{5}$ CT-26. Mice were sacrificed 25 days later, and lung metastasis were assessed. Normal lung weight is about 0.2g.

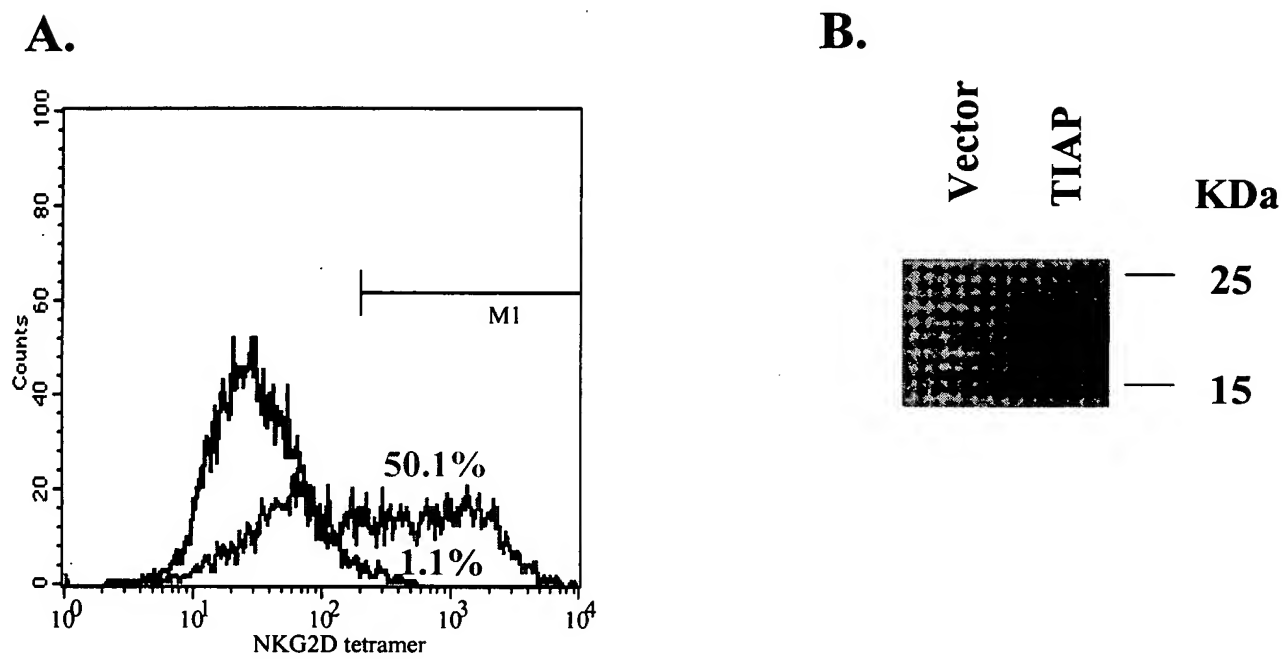
FIG. 22

Therapeutic models



BALB/c mice were inoculated i.v. $1x10^5$ CT-26 on day 0. Mice were treated with attenuated *Salmonella typhimurium* harboring the vectors as indicated on days 5 and 19 . Experiments were terminated on day 26, and lung metastasis of the survivor mice were assessed.

FIG. 23



A. Expression of H60: 293T cells were transfected with either empty vector (red) or pH60 (green) for 24 hours, harvested, stained with NKG2D tetramer and analyzed by flow cytometry. Transfection efficiency is around 45% assessed by pGFP transfection. **B. Expression of TIAP:** 293T cells were transfected with either empty vector or pTIAP for 24 hours, harvested, lysed and analyzed by western blot.

FIG. 24

```
   1 atcccagccc acgcacagac ccccaacttg cagctgccca cctcaccctc agctctggcc
  61 tcttactcac cctctaccac agacatggct cagtcactgg ctctgagcct ccttatcctg
 121 gttctggcct ttggcatccc caggacccaa ggcagtgatg gaggggctca ggactgttgc
 181 ctcaagtaca gccaaaggaa gattcccgcc aaggttgtcc gcagctaccg gaagcaggaa
 241 ccaagcttag gctgctccat cccagctatc ctgttcttgc cccgcaagcg ctctcaggca
 301 gagctatgtg cagacccaaa ggagctctgg gtgcagcagc tgatgcagca tctggacaag
 361 acaccatccc cacagaaacc agcccagggc tgcaggaagg acaggggggc ctccaagact
 421 ggcaagaaag gaaagggctc caaaggctgc aagaggactg agcggtcaca gacccctaaa
 481 gggccatagc ccagtgagca gcctggagcc ctggagaccc caccagcctc accagcgctt
 541 gaagcctgaa cccaagatgc aagaaggagg ctatgctcag gggccctgga gcagccaccc
 601 catgctggcc ttgccacact ctttctcctg ctttaaccac cccatctgca ttcccagctc
 661 taccctgcat ggctgagctg cccacagcag gccaggtcca gagagaccga ggagggagag
 721 tctcccaggg agcatgagag gaggcagcag gactgtcccc ttgaaggaga atcatcagga
 781 ccctggacct gatacggctc cccagtacac cccacctctt ccttgtaaat atgatttata
 841 cctaactgaa taaaaagctg ttctgtcttc ccacccaa  (MURINE SLC CCL21a)
```

(SEQ ID NO: 11)

FIG. 25

MAQSLALSLLILVLAFGIPRTQGSDGGAQDCCLKYSQRKIPAKVVRSYRKQ
EPSLGCSIPAILFLPRKRSQAELCADPKELWVQQLMQHLDKTPSPQKPAQG
CRKDRGASKTGKKGKGSKGCKRTERSQTPKGP (SEQ ID NO: 12)

(MURINE SLC CCL21a)

FIG. 26

Human MICA

```
   1 atggggctgg gcccggtctt cctgcttctg gctggcatct tccctttttgc acctccggga
  61 gctgctgctg agccccacag tcttcgttat aacctcacgg tgctgtcctg ggatggatct
 121 gtgcagtcag ggtttctcac tgaggtacat ctggatggtc agcccttcct gcgctgtgac
 181 aggcagaaat gcagggcaaa gccccaggga cagtgggcag aagatgtcct gggaaataag
 241 acatgggaca gagagaccag agacttgaca gggaacggaa aggacctcag gatgaccctg
 301 gctcatatca aggaccagaa agaaggcttg cattccctcc aggagattag ggtctgtgag
 361 atccatgaag acaacagcac caggagctcc cagcatttct actacgatgg ggagctcttc
 421 ctctcccaaa acctggagac taaggaatgg acaatgcccc agtcctccag agctcagacc
 481 ttggccatga acgtcaggaa tttcttgaag gaagatgcca tgaagaccaa gacacactat
 541 cacgctatgc atgcagactg cctgcaggaa ctacggcgat atctaaaatc cggcgtagtc
 601 ctgaggagaa cagtgccccc catggtgaat gtcacccgca gcgaggcctc agagggcaac
 661 attaccgtga catgcagggc ttctggcttc tatccctgga atatcacact gagctggcgt
 721 caggatgggg tatctttgag ccacgacacc cagcagtggg gggatgtcct gcctgatggg
 781 aatggaacct accagacctg ggtggccacc aggatttgcc aaggagagga gcagaggttc
 841 acctgctaca tggaacacag cgggaatcac agcactcacc ctgtgccctc tgggaaagtg
 901 ctggtgcttc agagtcattg gcagacattc catgtttctg ctgttgctgc tgctgctgct
 961 atttttgtta ttattatttt ctatgtccgt tgttgtaaga agaaaacatc agctgcagag
1021 ggtccagagc tcgtgagcct gcaggtcctg gatcaacacc cagttgggac gagtgaccac
1081 agggatgcca cacagctcgg atttcagcct ctgatgtcag atcttgggtc cactggctcc
1141 actgagggcg cctag   (SEQ ID NO: 13)
```

FIG. 27

Human MICA

MGLGPVFLLLAGIFPFAPPGAAAEPHSLRYNLTVLSWDGSVQSGFLTEVHL
DGQPFLRCDRQKCRAKPQGQWAEDVLGNKTWDRETRDLTGNGKDLRMTLAH
IKDQKEGLHSLQEIRVCEIHEDNSTRSSQHFYYDGELFLSQNLETKEWTMP
QSSRAQTLAMNVRNFLKEDAMKTKTHYHAMHADCLQELRRYLKSGVVLRRT
VPPMVNVTRSEASEGNITVTCRASGFYPWNITLSWRQDGVSLSHDTQQWGD
VLPDGNGTYQTWVATRICQGEEQRFTCYMEHSGNHSTHPVPSGKVLVLQSH
WQTFHVSAVAAAAAIFVIIIFYVRCCKKKTSAAEGPELVSLQVLDQHPVGT
SDHRDATQLGFQPLMSDLGSTGSTEGA (SEQ ID NO: 14)

FIG. 28

Human MICB

```
   1 gggccatggg gctgggccgg gtcctgctgt ttctggccgt cgccttccct tttgcacccc
  61 cggcagccgc cgctgagccc cacagtcttc gttacaacct catggtgctg tcccaggatg
 121 gatctgtgca gtcagggttt ctcgctgagg gacatctgga tggtcagccc ttcctgcgct
 181 atgacaggca gaaacgcagg gcaaagcccc agggacagtg ggcagaagat gtcctgggag
 241 ctgagacctg ggacacagag accgaggact tgacagagaa tgggcaagac ctcaggagga
 301 ccctgactca tatcaaggac cagaaaggag gcttgcattc cctccaggag attagggtct
 361 gtgagatcca tgaagacagc agcaccaggg gctcccggca tttctactac aatggggagc
 421 tcttcctctc ccaaaacctg gagactcaag aatcgacagt gccccagtcc tccagagctc
 481 agaccttggc tatgaacgtc acaaatttct ggaaggaaga tgccatgaag accaagacac
 541 actatcgcgc tatgcaggca gactgcctgc agaaactaca gcgatatctg aaatccgggg
 601 tggccatcag gagaacagtg ccccccatgg tgaatgtcac ctgcagcgag gtctcagagg
 661 gcaacatcac cgtgacatgc agggcttcca gcttctatcc ccggaatatc acactgacct
 721 ggcgtcagga tggggtatct ttgagccaca acacccagca gtgggggggat gtcctgcctg
 781 atgggaatgg aacctaccag acctgggtgg ccaccaggat tcgccaagga gaggagcaga
 841 ggttcacctg ctacatggaa cacagcggga atcacggcac tcaccctgtg ccctctggga
 901 aggcgctggt gcttcagagt caacggacag actttccata tgtttctgct gctatgccat
 961 gttttgttat tattattatt ctctgtgtcc cttgttgcaa gaagaaaaca tcagcggcag
1021 agggtccaga gcttgtgagc ctgcaggtcc tggatcaaca cccagttggg acaggagacc
1081 acagggatgc agcacagctg ggatttcagc ctctgatgtc agctactggg tccactggtt
1141 ccactgaggg cgcctagact ctacagccag gcggccagga ttcaactccc tgcctggatc
1201 tcaccagcac tttccctctg tttcctgacc tatgaaacag aaaataacat cacttattta
1261 ttgttgttgg atgctgcaaa gtgttagtag gtatgaggtg tttgctgctc tgccacgtag
1321 agagccagca aagggatcat gaccaactca acattccatt ggaggctata tgatcaaaca
```

FIG. 29

1381 gcaaattgtt tatcatgaat gcaggatgtg ggcaaactca cgactgctcc tgccaacaga
1441 aggtttgctg agggcattca ctccatggtg ctcattggag ttatctactg ggtcatctag
1501 agcctattgt ttgaggaatg cagtcttaca agcctactct ggacccagca gctgactcct
1561 tcttccaccc ctcttcttgc tatctcctat accaataaat acgaagggct gtggaagatc
1621 agagcccttg ttcacgagaa gcaagaagcc ccctgacccc ttgttccaaa tatactcttt
1681 tgtctttctc tttattccca cgttcgccct ttgttcagtc caatacaggg ttgtggggcc
1741 cttaacagtg ccatattaat tggtatcatt atttctgttg tttttgtttt tgtttttgtt
1801 tttgtttttg agacagagtc tcactctgtc acccaggctg cagttcactg gtgtgatctc
1861 agctcactgc aacctctgcc tcccaggttc aagcacttct cgtacctcag actcccgaat
1921 agctgggatt acagacaggc accaccacac ccagctaatt tttgtatttt ttgtagagac
1981 ggggtttcgc caagttgacc agcccagttt caaactcctg acctcaggtg atctgcctgc
2041 cttggcatcc caaagtgctg ggattacaag aatgagccac cgtgcctggc ctattttatt
2101 atattgtaat atattttatt atattagcca ccatgcctgt cctatttttct tatgttttaa
2161 tatattttaa tatattacat gtgcagtaat tagattatca tgggtgaact ttatgagtga
2221 gtatcttggt gatgactcct cctgaccagc ccaggaccag ctttcttgtc accttgaggt
2281 cccctcgccc cgtcacaccg ttatgcatta ctctgtgtct actattatgt gtgcataatt
2341 tataccgtaa atgtttactc tttaaataga aaaaaaaaaa aaaaa

(SEQ ID NO: 15)

FIG. 29 Cont.

Human MICB

MGLGRVLLFLAVAFPFAPPAAAAEPHSLRYNLMVLSQDGSVQSGFLAEG
HLDGQPFLRYDRQKRRAKPQGQWAEDVLGAETWDTETEDLTENGQDLRR
TLTHIKDQKGGLHSLQEIRVCEIHEDSSTRGSRHFYYNGELFLSQNLET
QESTVPQSSRAQTLAMNVTNFWKEDAMKTKTHYRAMQADCLQKLQRYLK
SGVAIRRTVPPMVNVTCSEVSEGNITVTCRASSFYPRNITLTWRQDGVS
LSHNTQQWGDVLPDGNGTYQTWVATRIRQGEEQRFTCYMEHSGNHGTHP
VPSGKALVLQSQRTDFPYVSAAMPCFVIIIILCVPCCKKKTSAAEGPEL
VSLQVLDQHPVGTGDHRDAAQLGFQPLMSATGSTGSTEGA

(SEQ ID NO: 16)

FIG. 30

Human ULBP1

```
  1 atggcagcgg ccgccagccc cgccttcctt ctgtgcctcc cgcttctgca cctgctgtct
 61 ggctggtccc gggcaggatg ggtcgacaca cactgtcttt gctatgactt catcatcact
121 cctaagtcca gacctgaacc acagtggtgt gaagttcaag gcctggtgga tgaaaggcct
181 tttcttcact atgactgtgt taaccacaag gccaaagcct ttgcttctct ggggaagaaa
241 gtcaatgtca caaaaacctg ggaagaacaa actgaaacac taagagacgt ggtggatttc
301 cttaaagggc aactgcttga cattcaagtg gagaatttaa tacccattga gcccctcacc
361 ctgcaggcca ggatgtcttg tgagcatgaa gcccatggac acggcagagg atcttggcag
421 ttcctcttca atggacagaa gttcctcctc tttgactcaa acaacagaaa gtggacagca
481 cttcatcctg gagccaagaa gatgacagag aagtgggaga agaacaggga tgtgaccatg
541 ttcttccaga agatttcact gggggattgt aagatgtggc ttgaagaatt tttgatgtac
601 tgggaacaaa tgctggatcc aacaaaacca ccctctctgg ccccaggcac aacccaaccc
661 aaggccatgg ccaccaccct cagtccctgg agccttctca tcatcttcct ctgcttcatt
721 ctagctggca gatga   (SEQ ID NO: 17)
```

FIG. 31

Human ULBP1

MAAAASPAFLLCLPLLHLLSGWSRAGWVDTHCLCYDFIITPKSRPEPQWCEV
QGLVDERPFLHYDCVNHKAKAFASLGKKVNVTKTWEEQTETLRDVVDFLKGQ
LLDIQVENLIPIEPLTLQARMSCEHEAHGHGRGSWQFLFNGQKFLLFDSNNR
KWTALHPGAKKMTEKWEKNRDVTMFFQKISLGDCKMWLEEFLMYWEQMLDPT
KPPSLAPGTTQPKAMATTLSPWSLLIIFLCFILAGR (SEQ ID NO: 18)

FIG. 32

Human ULBP2

```
  1 atggcagcag ccgccgctac caagatcctt ctgtgcctcc cgcttctgct cctgctgtcc
 61 ggctggtccc gggctgggcg agccgaccct cactctcttt gctatgacat caccgtcatc
121 cctaagttca gacctggacc acggtggtgt gcggttcaag gccaggtgga tgaaaagact
181 tttcttcact atgactgtgg caacaagaca gtcacacctg tcagtcccct ggggaagaaa
241 ctaaatgtca caacggcctg gaaagcacag aacccagtac tgagagaggt ggtggacata
301 cttacagagc aactgcgtga cattcagctg gagaattaca cacccaagga acccctcacc
361 ctgcaggcaa ggatgtcttg tgagcagaaa gctgaaggac acagcagtgg atcttggcag
421 ttcagtttcg atgggcagat cttcctcctc tttgactcag agaagagaat gtggacaacg
481 gttcatcctg gagccagaaa gatgaaagaa aagtgggaga atgacaaggt tgtggccatg
541 tccttccatt acttctcaat gggagactgt ataggatggc ttgaggactt cttgatgggc
601 atggacagca ccctggagcc aagtgcagga gcaccactcg ccatgtcctc aggcacaacc
661 caactcaggg ccacagccac caccctcatc ctttgctgcc tcctcatcat cctcccctgc
721 ttcatcctcc ctggcatctg a   (SEQ ID NO: 19)
```

FIG. 33

Human ULBP2

MAAAAATKILLCLPLLLLLSGWSRAGRADPHSLCYDITVIPKFRPGPRWC
AVQGQVDEKTFLHYDCGNKTVTPVSPLGKKLNVTTAWKAQNPVLREVVDI
LTEQLRDIQLENYTPKEPLTLQARMSCEQKAEGHSSGSWQFSFDGQIFLL
FDSEKRMWTTVHPGARKMKEKWENDKVVAMSFHYFSMGDCIGWLEDFLMG
MDSTLEPSAGAPLAMSSGTTQLRATATTLILCCLLIILPCFILPGI
(SEQ ID NO: 20)

FIG. 34

Human ULBP3

```
   1 atggcagcgg ccgccagccc cgcgatcctt ccgcgcctcg cgattcttcc gtacctgcta
  61 ttcgactggt ccgggacggg gcgggccgac gctcactctc tctggtataa cttcaccatc
 121 attcatttgc ccagacatgg gcaacagtgg tgtgaggtcc agagccaggt ggatcagaag
 181 aattttctct cctatgactg tggcagtgac aaggtcttat ctatgggtca cctagaagag
 241 cagctgtatg ccacagatgc ctggggaaaa caactggaaa tgctgagaga ggtggggcag
 301 aggctcagac tggaactggc tgacactgag ctggaggatt tcacacccag tggacccctc
 361 acgctgcagg tcaggatgtc ttgtgagtgt gaagccgatg gatacatccg tggatcttgg
 421 cagttcagct tcgatggacg gaagttcctc ctctttgact caaacaacag aaagtggaca
 481 gtggttcacg ctggagccag gcggatgaaa gagaagtggg agaaggatag cggactgacc
 541 accttcttca agatggtctc aatgagagac tgcaagagct ggcttaggga cttcctgatg
 601 cacaggaaga agaggctgga acccacagca ccacccacca tggccccagg cttagctcaa
 661 cccaaagcca tagccaccac cctcagtccc tggagcttcc tcatcatcct ctgcttcatc
 721 ctccctggca tctga   (SEQ ID NO: 21)
```

FIG. 35

Human ULBP3

MAAAASPAILPRLAILPYLLFDWSGTGRADAHSLWYNFTIIHLPRHGQQW
CEVQSQVDQKNFLSYDCGSDKVLSMGHLEEQLYATDAWGKQLEMLREVGQ
RLRLELADTELEDFTPSGPLTLQVRMSCECEADGYIRGSWQFSFDGRKFL
LFDSNNRKWTVVHAGARRMKEKWEKDSGLTTFFKMVSMRDCKSWLRDFLM
HRKKRLEPTAPPTMAPGLAQPKAIATTLSPWSFLIILCFILPGI
(SEQ ID NO: 22)

FIG. 36

MGAPTLPPAWQPFLKDHRISTFKNWPFLEGCACTPERMAEAGFIHCPTENE
PDLAQCFFCFKELEGWEPDDDPIGPGTVAYACNTSTLGGRGGRITREEHKK
HSSGCAFLSVKKQFEELTLGEFLKLDRERAKNKIAKETNNKKKEFEETAKK
VRRAIEQLAAMD (SEQ ID NO: 23)

HUMAN SURVIVIN-2B splice variant

MGAPTLPPAWQPFLKDHRISTFKNWPFLEGCACTPERMAEAGFIHCPTENE
PDLAQCFFCFKELEGWEPDDDPMQRKPTIRRKNLRKLRRKCAVPSSSWLPWI
EASGRSCLVPEWLHHFQGLFPGATSLPVGPLAMS (SEQ ID NO: 24)

HUMAN SURVIVIN-ΔEx3 splice variant

FIG. 37

```
GENBANK      NP_005922. MHC class I polyp...[gi:5174565]  BLink, Domains, Links
LOCUS        MICB                    383 aa            linear   PRI 13-DEC-2002
DEFINITION   MHC class I polypeptide-related sequence B; MHC class I-like
             molecule PERB11.2-IMX; stress inducible class I homolog; MHC class
             I mic-B antigen; MHC class I chain-related protein B; MHC class I
             molecule [Homo sapiens].
ACCESSION    NP_005922
VERSION      NP_005922.1  GI:5174565
DBSOURCE     REFSEQ: accession NM_005931.2
KEYWORDS     .
SOURCE       Homo sapiens (human)
  ORGANISM   Homo sapiens
             Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
             Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
REFERENCE    1  (residues 1 to 383)
  AUTHORS    Bahram,S., Bresnahan,M., Geraghty,D.E. and Spies,T.
  TITLE      A second lineage of mammalian major histocompatibility complex
             class I genes
  JOURNAL    Proc. Natl. Acad. Sci. U.S.A. 91 (14), 6259-6263 (1994)
  MEDLINE    94294361
   PUBMED    8022771
REFERENCE    2  (residues 1 to 383)
  AUTHORS    Bahram,S. and Spies,T.
  TITLE      Nucleotide sequence of a human MHC class I MICB cDNA
  JOURNAL    Immunogenetics 43 (4), 230-233 (1996)
  MEDLINE    96163024
   PUBMED    8575823
REFERENCE    3  (residues 1 to 383)
  AUTHORS    Nalabolu,S.R., Shukla,H., Nallur,G., Parimoo,S. and Weissman,S.M.
  TITLE      Genes in a 220-kb region spanning the TNF cluster in human MHC
  JOURNAL    Genomics 31 (2), 215-222 (1996)
  MEDLINE    96422187
   PUBMED    8824804
REFERENCE    4  (residues 1 to 383)
  AUTHORS    Groh,V., Bahram,S., Bauer,S., Herman,A., Beauchamp,M. and Spies,T.
  TITLE      Cell stress-regulated human major histocompatibility complex class
             I gene expressed in gastrointestinal epithelium
  JOURNAL    Proc. Natl. Acad. Sci. U.S.A. 93 (22), 12445-12450 (1996)
  MEDLINE    97057262
   PUBMED    8901601
REFERENCE    5  (residues 1 to 383)
  AUTHORS    Bahram,S., Shiina,T., Oka,A., Tamiya,G. and Inoko,H.
  TITLE      Genomic structure of the human MHC class I MICB gene
  JOURNAL    Immunogenetics 45 (2), 161-162 (1996)
  MEDLINE    97113304
   PUBMED    8952966
REFERENCE    6  (residues 1 to 383)
  AUTHORS    Groh,V., Steinle,A., Bauer,S. and Spies,T.
  TITLE      Recognition of stress-induced MHC molecules by intestinal
             epithelial gammadelta T cells
  JOURNAL    Science 279 (5357), 1737-1740 (1998)
  MEDLINE    98163553
   PUBMED    9497295
REFERENCE    7  (residues 1 to 383)
  AUTHORS    Steinle,A., Groh,V. and Spies,T.
  TITLE      Diversification, expression, and gamma delta T cell recognition of
             evolutionarily distant members of the MIC family of major
             histocompatibility complex class I-related molecules
  JOURNAL    Proc. Natl. Acad. Sci. U.S.A. 95 (21), 12510-12515 (1998)
  MEDLINE    98445401
   PUBMED    9770516
REFERENCE    8  (residues 1 to 383)
  AUTHORS    Braud,V.M., Allan,D.S. and McMichael,A.J.
```

FIG. 38

```
  TITLE     Functions of nonclassical MHC and non-MHC-encoded class I molecules
  JOURNAL   Curr. Opin. Immunol. 11 (1), 100-108 (1999)
  MEDLINE   99158668
   PUBMED   10047540
REFERENCE   9  (residues 1 to 383)
  AUTHORS   Cerwenka,A., Bakker,A.B., McClanahan,T., Wagner,J., Wu,J.,
            Phillips,J.H. and Lanier,L.L.
  TITLE     Retinoic acid early inducible genes define a ligand family for the
            activating NKG2D receptor in mice
  JOURNAL   Immunity 12 (6), 721-727 (2000)
  MEDLINE   20350669
   PUBMED   10894171
REFERENCE   10 (residues 1 to 383)
  AUTHORS   Steinle,A., Li,P., Morris,D.L., Groh,V., Lanier,L.L., Strong,R.K.
            and Spies,T.
  TITLE     Interactions of human NKG2D with its ligands MICA, MICB, and
            homologs of the mouse RAE-1 protein family
  JOURNAL   Immunogenetics 53 (4), 279-287 (2001)
  MEDLINE   21383614
   PUBMED   11491531
REFERENCE   11 (residues 1 to 383)
  AUTHORS   Borrego,F., Kabat,J., Kim,D.K., Lieto,L., Maasho,K., Pena,J.,
            Solana,R. and Coligan,J.E.
  TITLE     Structure and function of major histocompatibility complex (MHC)
            class I specific receptors expressed on human natural killer (NK)
            cells
  JOURNAL   Mol. Immunol. 38 (9), 637-660 (2002)
  MEDLINE   21848355
   PUBMED   11858820
COMMENT     REVIEWED REFSEQ: This record has been curated by NCBI staff. The
            reference sequence was derived from U65416.1 and BU684700.1.
            Summary: This gene encodes a heavily glycosylated protein which is
            a ligand for the NKG2D type II receptor. Binding of the ligand
            activates the cytolytic response of natural killer (NK) cells, CD8
            alphabeta T cells, and gammadelta T cells which express the
            receptor. This protein is stress-induced and is similar to MHC
            class I molecules; however, it does not associate with
            beta-2-microglobulin or bind peptides.
FEATURES             Location/Qualifiers
     source          1..383
                     /organism="Homo sapiens"
                     /db_xref="taxon:9606"
                     /chromosome="6"
                     /map="6p21.3"
     Protein         1..383
                     /product="MHC class I polypeptide-related sequence B"
                     /note="MHC class I-like molecule PERB11.2-IMX; stress
                     inducible class I homolog; MHC class I mic-B antigen; MHC
                     class I chain-related protein B; MHC class I molecule"
     Region          24..198
                     /region_name="Class I Histocompatibility antigen, domains
                     alpha 1 and 2"
                     /note="MHC_I"
                     /db_xref="CDD:pfam00129"
     variation       59
                     /allele="C"
                     /allele="Y"
                     /db_xref="dbSNP:1051786"
     variation       64
                     /allele="R"
                     /allele="C"
                     /db_xref="dbSNP:2240858"
     variation       75
```

FIG. 38 Cont.

```
                     /allele="N"
                     /allele="D"
                     /allele="N"
                     /allele="D"
                     /db_xref="dbSNP:3131639"
     variation       80
                     /allele="K"
                     /allele="E"
                     /allele="K"
                     /db_xref="dbSNP:1065075"
     variation       121
                     /allele="M"
                     /allele="I"
                     /allele="M"
                     /db_xref="dbSNP:3134900"
     variation       136
                     /allele="N"
                     /allele="D"
                     /allele="H"
                     /allele="N"
                     /allele="D"
                     /db_xref="dbSNP:1051788"
     variation       148
                     /allele="E"
                     /allele="K"
                     /db_xref="dbSNP:1051791"
     Region          222..292
                     /region_name="Immunoglobulin C-Type"
                     /note="IGc1"
                     /db_xref="CDD:smart00407"
     variation       238
                     /allele="S"
                     /allele="T"
                     /db_xref="dbSNP:1051799"
     variation       383
                     /allele="A"
                     /allele="T"
                     /allele="A"
                     /allele="T"
                     /db_xref="dbSNP:1065076"
     CDS             1..383
                     /gene="MICB"
                     /coded_by="NM_005931.2:6..1157"
                     /db_xref="LocusID:4277"
                     /db_xref="MIM:602436"
ORIGIN
        1 mglgrvllfl avafpfappa aaaephslry nlmvlsqdgs vqsgflaegh ldgqpflryd
       61 rqkrrakpqg qwaedvlgae twdtetedlt engqdlrrtl thikdqkggl hslqeirvce
      121 ihedsstrgs rhfyyngelf lsqnletqes tvpqssraqt lamnvtnfwk edamktkthy
      181 ramqadclqk lqrylksgva irrtvppmvn vtcsevsegn itvtcrassf yprnitltwr
      241 qdgvslshnt qqwgdvlpdg ngtyqtwvat rirqgeeqrf tcymehsgnh gthpvpsgka
      301 lvlqsqrtdf pyvsaampcf viiiilcvpc ckkktsaaeg pelvslqvld qhpvgtgdhr
      361 daaqlgfqpl msatgstgst ega
//
```

FIG. 38 Cont.

Human livin alpha splice variant

```
   1 ccctgggata ctcccctccc agggtgtctg gtggcaggcc tgtgcctatc cctgctgtcc
  61 ccagggtggg ccccgggggt caggagctcc agaagggcca gctgggcata ttctgagatt
 121 ggccatcagc ccccatttct gctgcaaacc tggtcagagc cagtgttccc tccatgggac
 181 ctaaagacag tgccaagtgc ctgcaccgtg gaccacagcc gagccactgg gcagccggtg
 241 atggtcccac gcaggagcgc tgtggacccc gctctctggg cagccctgtc ctaggcctgg
 301 acacctgcag agcctgggac cacgtggatg ggcagatcct gggccagctg cggcccctga
 361 cagaggagga agaggaggag ggcgccgggg ccaccttgtc caggggggcct gccttccccg
 421 gcatgggctc tgaggagttg cgtctggcct ccttctatga ctggccgctg actgctgagg
 481 tgccacccga gctgctggct gctgccggct tcttccacac aggccatcag gacaaggtga
 541 ggtgcttctt ctgctatggg ggcctgcaga gctggaagcg cggggacgac ccctggacgg
 601 agcatgccaa gtggttcccc agctgtcagt tcctgctccg gtcaaaagga agagactttg
 661 tccacagtgt gcaggagact cactcccagc tgctgggctc ctgggacccg tgggaagaac
 721 cggaagacgc agcccctgtg gccccctccg tccctgcctc tgggtaccct gagctgccca
 781 cacccaggag agaggtccag tctgaaagtg cccaggagcc aggaggggtc agtccagccg
 841 aggcccagag ggcgtggtgg gttcttgagc ccccaggagc cagggatgtg gaggcgcagc
 901 tgcggcggct gcaggaggag aggacgtgca aggtgtgcct ggaccgcgcc gtgtccatcg
 961 tctttgtgcc gtgcggccac ctggtctgtg ctgagtgtgc ccccggcctg cagctgtgcc
1021 ccatctgcag agcccccgtc cgcagccgcg tgcgcacctt cctgtcctag gccaggtgcc
1081 atggccggcc aggtgggctg cagagtgggc tccctgcccc tctctgcctg ttctggactg
1141 tgttctgggc ctgctgagga tggcagagct ggtgtccatc cagcactgac cagccctgat
1201 tccccgacca ccgcccaggg tggagaagga ggcccttgct tggcgtgggg gatggcttaa
1261 ctgtacctgt ttggatgctt ctgaatagaa ataaagtggg ttttccctgg aggtacccag
1321 ca
```

(SEQ ID NO: 26)

FIG. 39

Human livin alpha splice variant

MGPKDSAKCLHRGPQPSHWAAGDGPTQERCGPRSLGSPVLGLDTCRAWD

HVDGQILGQLRPLTEEEEEEGAGATLSRGPAFPGMGSEELRLASFYDWP

LTAEVPPELLAAAGFFHTGHQDKVRCFFCYGGLQSWKRGDDPWTEHAKW

FPSCQFLLRSKGRDFVHSVQETHSQLLGSWDPWEEPEDAAPVAPSVPAS

GYPELPTPRREVQSESAQEPGGVSPAEAQRAWWVLEPPGARDVEAQLRR

LQEERTCKVCLDRAVSIVFVPCGHLVCAECAPGLQLCPICRAPVRSRVR

TFLS

(SEQ ID NO: 27)

FIG. 40

Human livin beta splice variant

```
   1 ccctgggata ctcccctccc agggtgtctg gtggcaggcc tgtgcctatc cctgctgtcc
  61 ccagggtggg ccccgggggt caggagctcc agaagggcca gctgggcata ttctgagatt
 121 ggccatcagc ccccatttct gctgcaaacc tggtcagagc cagtgttccc tccatgggac
 181 ctaaagacag tgccaagtgc ctgcaccgtg gaccacagcc gagccactgg gcagccggtg
 241 atggtcccac gcaggagcgc tgtggacccc gctctctggg cagccctgtc ctaggcctgg
 301 acacctgcag agcctgggac cacgtggatg ggcagatcct gggccagctg cggcccctga
 361 cagaggagga agaggaggag ggcgccgggg ccaccttgtc caggggggct gccttccccg
 421 gcatgggctc tgaggagttg cgtctggcct ccttctatga ctggccgctg actgctgagg
 481 tgccacccga gctgctggct gctgccggct tcttccacac aggccatcag gacaaggtga
 541 ggtgcttctt ctgctatggg ggcctgcaga gctggaagcg cggggacgac ccctggacgg
 601 agcatgccaa gtggttcccc agctgtcagt tcctgctccg gtcaaaagga agagactttg
 661 tccacagtgt gcaggagact cactcccagc tgctgggctc ctgggacccg tgggaagaac
 721 cggaagacgc agcccctgtg gccccctccg tccctgcctc tgggtaccct gagctgccca
 781 cacccaggag agaggtccag tctgaaagtg cccaggagcc aggagccagg gatgtggagg
 841 cgcagctgcg gcggctgcag gaggagagga cgtgcaaggt gtgcctggac cgcgccgtgt
 901 ccatcgtctt tgtgccgtgc ggccacctgg tctgtgctga gtgtgccccc ggcctgcagc
 961 tgtgccccat ctgcagagcc cccgtccgca gccgcgtgcg caccttcctg tcctaggcca
1021 ggtgccatgg ccggccaggt gggctgcaga gtgggctccc tgcccctctc tgcctgttct
1081 ggactgtgtt ctgggcctgc tgaggatggc agagctggtg tccatccagc actgaccagc
1141 cctgattccc cgaccaccgc ccagggtgga gaaggaggcc cttgcttggc gtgggggatg
1201 gcttaactgt acctgtttgg atgcttctga atagaaataa agtgggtttt ccctggaggt
1261 acccagca
```

FIG. 41

Human livin beta splice variant

MGPKDSAKCLHRGPQPSHWAAGDGPTQERCGPRSLGSPVLGLDTCRAWD

HVDGQILGQLRPLTEEEEEEGAGATLSRGPAFPGMGSEELRLASFYDWP

LTAEVPPELLAAAGFFHTGHQDKVRCFFCYGGLQSWKRGDDPWTEHAKW

FPSCQFLLRSKGRDFVHSVQETHSQLLGSWDPWEEPEDAAPVAPSVPAS

GYPELPTPRREVQSESAQEPGARDVEAQLRRLQEERTCKVCLDRAVSIV

FVPCGHLVCAECAPGLQLCPICRAPVRSRVRTFLS

(SEQ ID NO: 29)

FIG. 42